REMARKS

The above-identified application has been carefully reviewed in view of the Office Action of October 2, 2001. The Office Action required that Figures 1 and 3 be designated with the legend "Prior Art". Claims 1 and 5 were rejected as being anticipated by Schieber Patent No. 5,615,763. Claims 2-4 and 6-14 were rejected as being obvious over Dumbaugh Patent No. 4,149,627 in view of Rosenstrom Patent No. 6,024,210. No specific rejection was made of independent method claim 15 or its dependent claims 16-18. Reconsideration of this application is respectfully requested in view of the amendments above and the remarks which follow.

The Office Action required that Figures 1 and 3 be designated with the legend "Prior Art." Attached hereto are two drawing sheets including Figures 1 and 3 wherein the legend "Prior Art" has been added in red to these drawing sheets. Approval of this drawing change is respectfully requested.

Independent claim 1 was rejected as being anticipated by Schieber. The Schieber conveyor system is operated by a "Single Input" or "Brute Force" type of drive as is shown in Figure 1 of the present application which is designated as "Prior Art." Schieber shows an eccentric weight 18a attached to a shaft 18, and an eccentric weight 22a attached to a shaft 22. The shafts 18 and 22 and the weights 18a and 22a, are mechanically coupled to one another for conjoint rotation by a belt 40. The weights 18a and 22a are conjointly rotated by a motor 30. Schieber also shows two eccentric weights 20a that are attached to, and that are conjointly rotatable with, a shaft 20. The weights 20a and shaft 20 are conjointly rotated by a motor 36. Thus the motor 30 conjointly rotates the weights 18a and 22a, and the motor 36 conjointly rotates the two weights 20a.

Independent claim 1 requires a first pair of rotatable eccentric weights coupled to the bed and a second pair of rotatable eccentric weights coupled to the bed (four eccentric weights). The

weights 18a and 22a in Schieber cannot be considered a first pair of rotatable eccentric weights coupled to the bed as these weights are mechanically coupled to one another for conjoint rotation and rotated by a single motor 30. As stated in the present application at page 3, line 11, eccentric weights that are installed on both ends of the shaft of a vibratory motor, such that they are mechanically coupled together for conjoint rotation, are cumulatively considered as a single rotatable eccentric weight. The weights 18a and 22a in Schieber are thus a single rotatable eccentric weight as they are mechanically coupled together for conjoint rotation. The two weights 20a in Schieber are similarly a single rotatable eccentric weight as they are mechanically coupled to one another for conjoint rotation. Schieber therefore effectively includes only two rotatable eccentric weights.

Claim 1 has been amended above to further clarify that each rotatable eccentric weight of the first pair of rotatable eccentric weights and each rotatable eccentric weight of the second pair of rotatable eccentric weights are all free-wheeling with respect to one another. Thus claim 1 requires at least four eccentric weights that are free-wheeling with respect to one another. The free-wheeling rotating eccentric weights of claim 1 are not physically or mechanically rotationally linked or coupled to one another to provide conjoint rotation. In Schieber the weight 18a is not free-wheeling with respect to the weight 22a as it is mechanically rotationally coupled to the weight 22a by the belt 40. Similarly in Schieber, the two weights 20a are not free-wheeling with respect to one another as they are mechanically rotationally coupled together by the shaft 20. Schieber therefore does not disclose a first pair of rotatable eccentric weights and a second pair of rotatable eccentric weights (four eccentric weights) that are each free-wheeling with respect to one another as required in claim 1. It is therefore respectfully submitted that independent claim 1 is allowable over the cited references. Claims 2-11 depend from claim 1 and are therefore also submitted to be in condition for allowance.

Independent claim 12 was rejected as being obvious over Dumbaugh in view of Rosenstrom. Rosenstrom was cited as teaching a control system and a plurality of motor and weight pairs in a vibratory apparatus.

Rosenstrom shows eccentric weights 50 and 52 that are mechanically rotationally coupled to one another by a belt 38 and that are conjointly rotated by a motor 34. Eccentric weights 54 and 56 are mechanically rotationally coupled to one another by a shaft 24 and are conjointly rotated by a motor 42. Eccentric weights 50a and 52a are mechanically rotationally coupled to one another by a belt 38a and are conjointly rotated by a motor 34a. Rosenstrom also shows eccentric weights 54a and 56a that are mechanically rotationally coupled to one another by a shaft and that are conjointly rotated by a motor 42a. The eccentric weights 50 and 52, the eccentric weights 54 and 56, the eccentric weights 50a and 52a, and the eccentric weights 54a and 56a, are not all <u>mechanically</u> rotationally coupled to one another for conjoint rotation in Rosenstrom. However, all of these weights are rotationally coupled to one another for conjoint rotation by an electrical controller such that the eccentric weights in Rosenstrom are not free-wheeling with respect to one another. Schieber, at column 4, line 42 states:

> In the invention as illustrated in the environment of Figs. 1 and 2, it is essential that each drive unit module contain the same angle of attack and the same magnitude of resultant forces. Thus, it is preferred that the counterpart shafts within frame 20 have eccentric weights of the same mass and angular orientation as those within frame 18. A control system for assuring the maintenance of the proper phase angles among the various rotating shafts is shown generally in Fig. 1 in which sensing or shaft encoder devices 58 are positioned adjacent each shaft 22, 24 and 22a, 24a. It should be recalled that shafts 26 and 26a are driven respectively by shafts 22 and 22a through a pulley and belt arrangement and thus always rotate at the same speed and thus have the same actual relative positions at all times.

While all the eccentric weights in Rosenstrom are not <u>mechanically</u> coupled to one another for conjoint rotation to assure the desired phase angles among the weights are maintained, the

eccentric weights in Rosenstrom are all phased in their angular orientation with respect to one another by an electrical control system.

Independent claim 12 has been amended above in the same manner as claim 1. Claim 12 requires that each of the rotatable eccentric weights of the first pair of rotatable eccentric weights and of the second pair of rotatable eccentric weights be free-wheeling with respect to one another. The eccentric weights in Rosenstrom are not free-wheeling with respect to one another, as the rotational position or phase of the weights are all interconnected and controlled by an electrical control system.

In Schieber mechanical means are used to rotationally couple the eccentric weights and force them to synchronize, and in Rosenstrom electrical control means are used to force the eccentric weights to synchronize. In the present application the electrical controls are used to simultaneously change the rotational speed of the vibratory motors to thereby adjust the conveying speed of the conveyor. The electrical controls in the present application do not adjust the phase or angular orientation of the various eccentric weights with respect to one another and consequently the eccentric weights in the present invention are free-wheeling with respect to one another. Rosenstrom does not disclose or teach the use of free-wheeling eccentric weights. It is therefore respectfully submitted that independent claim 12 is allowable over the cited references. Claims 13 and 14 depend from claim 12 and therefore are also submitted to be in condition for allowance.

No objections were raised against independent claim 15 or its dependent claim 16-18 in the Office Action. However, the method of claim 15 has been amended above to require that the eccentric weights are free-wheeling with respect to one another. It is respectfully submitted that independent claim 15 is allowable over the cited art. Claims 17 and 18 have also been amended to clarify that the electrical controls adjust the rotational speed of the vibratory motors, as

opposed to synchronizing the eccentric weights with respect to one another. As claims 16-18 depend from claim 15, these claims are also submitted to in condition for allowance.

Allowance of claims 1-18 is respectfully requested.

Respectfully submitted,

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Version With Markings to Show Changes Made

1. (Amended) A vibratory conveying apparatus for conveying material including:

a bed on which the material is conveyed;

a plurality of inclined stabilizers, each said stabilizer having a first end, a second end and a longitudinal axis, said first end of each said stabilizer being attached to said bed;

a first pair of rotatable eccentric weights coupled to said bed; and

a second pair of rotatable eccentric weights coupled to said bed, each said rotatable eccentric weight of said first pair of rotatable eccentric weights and of said second pair of rotatable eccentric weights being free-wheeling with respect to one another;

whereby rotation of said first pair of rotatable eccentric weights and rotation of said second pair of rotatable eccentric weights cause said bed to vibrate.

12. (Amended) A vibratory conveying apparatus for conveying material including:

a bed on which the material is conveyed;

a counterbalance;

a plurality of stabilizer members, each said stabilizer member having a first end attached to said bed, a second end attached to said counterbalance and a longitudinal axis, said longitudinal axes of said stabilizer members being generally parallel to one another;

a first pair of rotatable eccentric weights rotatably attached to said counterbalance; and

a second pair of rotatable eccentric weights rotatably attached to said counterbalance, each said rotatable eccentric weight of said first pair of rotatable eccentric weights and of said second pair of rotatable eccentric weights being free-wheeling with respect to one another;

whereby rotation of said first pair of rotatable weights and rotation of said second pair of rotatable weights cause said bed to vibrate.

15. (Amended) A method of vibrating a conveying apparatus to convey material including the steps of:

providing a bed having an inlet end and an outlet end on which material is adapted to be conveyed;

providing a plurality of drive springs, each drive spring having a first end attached to said bed and a second end attached to a support;

providing a plurality of pairs of vibratory motors, each vibratory motor having a rotatable eccentric weight, each said eccentric weight being free-wheeling with respect to one another, each said vibratory motor adapted to operate at an operating speed;

operating said vibratory motors to rotate said eccentric weights and thereby vibrate said bed at a vibration frequency; and

operating said vibratory motors at a selected operating speed which approaches being equal to, or is less than, the natural frequency of said drive springs which are vibrating said bed.

17. (Amended) The method of claim 15 including the step of adjusting the vibration frequency of said bed by use of an electrical control connected to said vibratory motors for simultaneously changing the rotational speed of said vibratory motors.

18. (Amended) The method of claim 15 including the step of adjusting the operating stroke and frequency of said drive springs and stabilizer members by use of an electrical control connected to said vibratory motors for simultaneously changing the rotational speed of said vibratory motors.